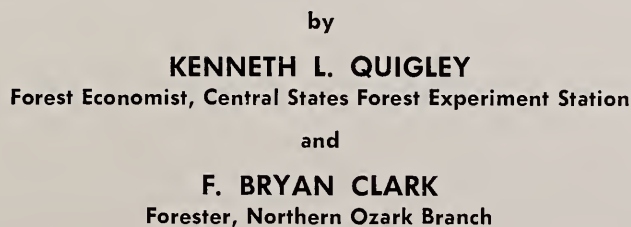


Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.



A circular library stamp with the text "LIBRARY RECEIVED" at the top, "AUG 29 1952" in the center, and "U.S. DEPT. OF AGRICULTURE" at the bottom. There are stars on either side of the date.

UNITED STATES
DEPARTMENT OF AGRICULTURE
LIBRARY



	BOOK NUMBER	1	
Title	828111	F76Fe	conducted under
State			16 by the Central
ern C			io, and its North-
Missc			operation with the
			pment, Jefferson
City, Missouri.			

Division of Resources and Development
COMMISSIONERS

GEO. D. CLAYTON, JR
Hannibal

UEL W. LAMKIN
Maryville

PRESTON N. COOK
Monett

ARTHUR D. LYNN
Kansas City

E. L. DALE
Carthage

J. RAYMOND LUCY
Parma

W. F. ENRIGHT
St. Joseph

GEORGE C. SMITH
St. Louis

HERMAN H. HAAG
Columbia

D. W. SNYDER
Jefferson City

FORREST SMITH
Governor



Figure 1. Hedge rows have long been an important source of fence posts in northwest Missouri.

a. The hedgerow pictured here is approximately 25 feet high and contains many post-sized trees.

b. Hedge rows, however, are fast disappearing, thus removing an important source of posts. This hedge row recently has been removed with a bulldozer.



FENCE POSTS, A POTENTIAL MARKET FOR MISSOURI PINE TIMBER

BY KENNETH L. QUIGLEY AND F. BRYAN CLARK

*A Fence Post Market Can Improve
The Management of Missouri Pine Stands*

A larger demand for treated pine posts in agricultural areas of the midwest may provide a new market for small pine timber from the Missouri Ozarks¹ (Cover). In the Ozarks, pine and pine-oak timber stands cover more than one million acres, and they now need, or soon will need, thinning to maintain optimum growth. Whether or not it is practical to thin these young stands depends upon the existence of markets for small-diameter trees (fig 2). At present, small sawlogs are easily marketed, but there is no well-established market for the large quantities of post-sized materials that would be removed in thinnings.

Northern Missouri, as well as southern Iowa, eastern Kansas, and southeastern Nebraska, contains little forest land

and must import large quantities of fence posts. Many of the redcedar and white oak posts that farmers in these areas use are shipped from the Ozarks, but the relatively few pine posts used in these areas are being shipped in from southern states. Creosote-treated pine posts from the Missouri Ozarks should be able to compete favorably with posts shipped greater distances. Large lumber and tie companies are just now becoming interested in obtaining pine posts from the Missouri Ozarks for pressure treatment, and a few of these companies have started to buy posts on a trial basis. Opportunities also exist for establishing small preservative treating plants in the Ozarks. In Virginia, Georgia, the Carolinas, and the Tennessee Valley, treating plants using a hot-and-

¹F. G. Liming, 1946. *The Range and Distribution of Shortleaf Pine in Missouri*. Central States Forest Experiment Station, Columbus, Ohio. Technical Paper No. 106.

cold- bath creosote treatment for pine posts have been operating successfully as cooperatives, community projects, and private enterprises².

If a market for properly treated Ozark pine posts can be developed, it will mean greater productivity for more than a million acres of forest land in Missouri. Furthermore, a large share of the purchase price of the posts will be passed on to people of local forest communities and to processors within the state.

POST USE IN NORTHWEST MISSOURI WAS STUDIED

A survey of post use and markets in farm areas near the Missouri Ozarks was made in the fall of 1950. The primary purpose of the survey was to determine the potential size of the market for treated pine posts in cornbelt areas near the Missouri Ozarks.

The Master Sample of Agriculture, an area-sampling system designed to obtain reliable information about any commodity grown or used by farmers, was used to select sample farms in a 23-county area in northwest Missouri (Cover.) This study area is considered representative of agricultural areas near the Missouri Ozarks. One hundred and seventy farmers living throughout the area were interviewed regarding their fence post requirements. The farmers furnished information on the number, kind, source, and price of posts they used in 1949. They also gave their reasons for using a particular kind of post, their opinion of the good and bad points of posts they were using, and their plans for post purchases in 1951. Several lumberyard operators who retail posts in the study area provided information on the number and kinds of fence posts sold in 1949 and gave their opinion of future markets for treated pine posts.

The study area is predominately agricultural. It contains 43,000 farms with a total farm area of about 7,370,000 acres. The average-size farm is about 171 acres, and 160 acres is the most common operating unit. Because farmers here specialize in livestock raising, they need good fences. Since some farmers do not have post timber on their farms, there is a good market for fence posts.

NORTHWEST MISSOURI FARMERS BUY APPROXIMATELY ONE-HALF OF THEIR POSTS

Farmers in northwest Missouri used about 5,054,000 fence posts in 1949. The average farmer used 117 posts, or about 68 posts per 100 acres. The number of posts used by indi-

Kind of post	1949		1951	
	Number	Percent	Number	Per cent
Hedge	1,271,200	54.7	1,136,200	38.3
Steel	378,300	16.3	238,600	8.0
White oak	330,800	14.2	138,900	4.7
Treated pine	159,300	6.9	719,400	24.3
Redcedar	142,300	6.1	42,900	1.4
Black locust	33,300	1.4	169,900	5.8
Used railroad ties	8,500	0.4	—	—
Undecided	—	—	520,000	17.5
Total	2,323,700	100.0	2,965,900	100.0

Table 2.—Number of posts purchased in 1949 by northwest Missouri farmers and estimated purchases for 1951.

vidual farmers varies a great deal from year to year. Some years they may build new fences; other years they may make only a few replacements or use no posts at all.

Nearly 60 per cent of the posts used was hedge (osage-orange); 22 per cent was white oak; 8 per cent was steel; and the remaining 10 per cent was black locust, treated pine, redcedar, and miscellaneous native species (fig. 3). Most of the white oak posts were split; the other wooden posts were usually round. Ninety-seven per cent of the posts was line posts averaging 6½ to 7 feet in length and 4 inches in diameter at the small end. The remaining 3 per cent was corner posts averaging 8½ to 9 feet in length and 8 to 10 inches in diameter. Farmers generally used the more durable species for corner posts.

Farmers obtained 51 per cent of the posts used in 1949 from their own land, 3 per cent by cutting on shares, and 46 per cent by outright purchase. Home-grown posts, those cut on the user's land and those cut on shares, are highly desirable from the farmer's viewpoint because they do not require cash outlay. When a farmer makes posts on shares, he generally keeps one-half of them; the other half goes to the landowner in lieu of payment for stumpage. About 63 per cent of the 2,730,000 home-grown posts was hedge, (Fig. 1) 28 per cent white oak, 6 per cent black locust, and 3 per cent miscellaneous species, mainly mulberry, elm, red oak, and black oak.

The remaining posts (2,324,000) were purchased. Fifty-five per cent of the total number purchased was hedge, 16 per cent steel, 14 per cent white oak, 7 per cent pressure-treated creosoted pine, 6 per cent redcedar and 2 per cent black locust and used railroad ties. For the most part, farmers purchased the hedge, white oak, redcedar, and black locust posts from private individuals or at community sales. They purchased treated pine and steel posts mainly from lumberyards and farmer exchanges. Although the majority of the wooden posts, except treated pine and redcedar, was grown locally, some hedge and white oak posts from southern Missouri were hauled into northwest Missouri by trucks. In some areas treated pine, redcedar, and steel posts were not on the market.

Farmers paid varying prices for fence posts (table 1). A few were able to buy white oak line fence posts for as little as \$0.12; some paid as much as \$1.10 for steel posts. Corner post prices ranged from \$0.50 for some white oak posts and

Kind of Post	Price range	Average Price
Line posts		
Hedge	\$0.13 - 0.65	\$0.43
White oak	.12 - .30	.21
Steel	.40 - 1.10	.78
Black locust	.30 - .39	.32
Treated pine	.60 - .65	.65
Redcedar	.31 - .60	.39
Corner posts		
Hedge	1.00 - 3.50	1.76
White oak	.50 - .75	.60
Treated pine	2.50 - 3.00	2.67
Used railroad ties	.50 - .50	.50

Table 1.—Prices paid by farmers in northwest Missouri for posts in 1949.

²R. A. Hertzler and Walton R. Smith. *The Preservative Treatment of Virginia's Fence Posts*. Department of Conservation and Development, Richmond, Virginia.



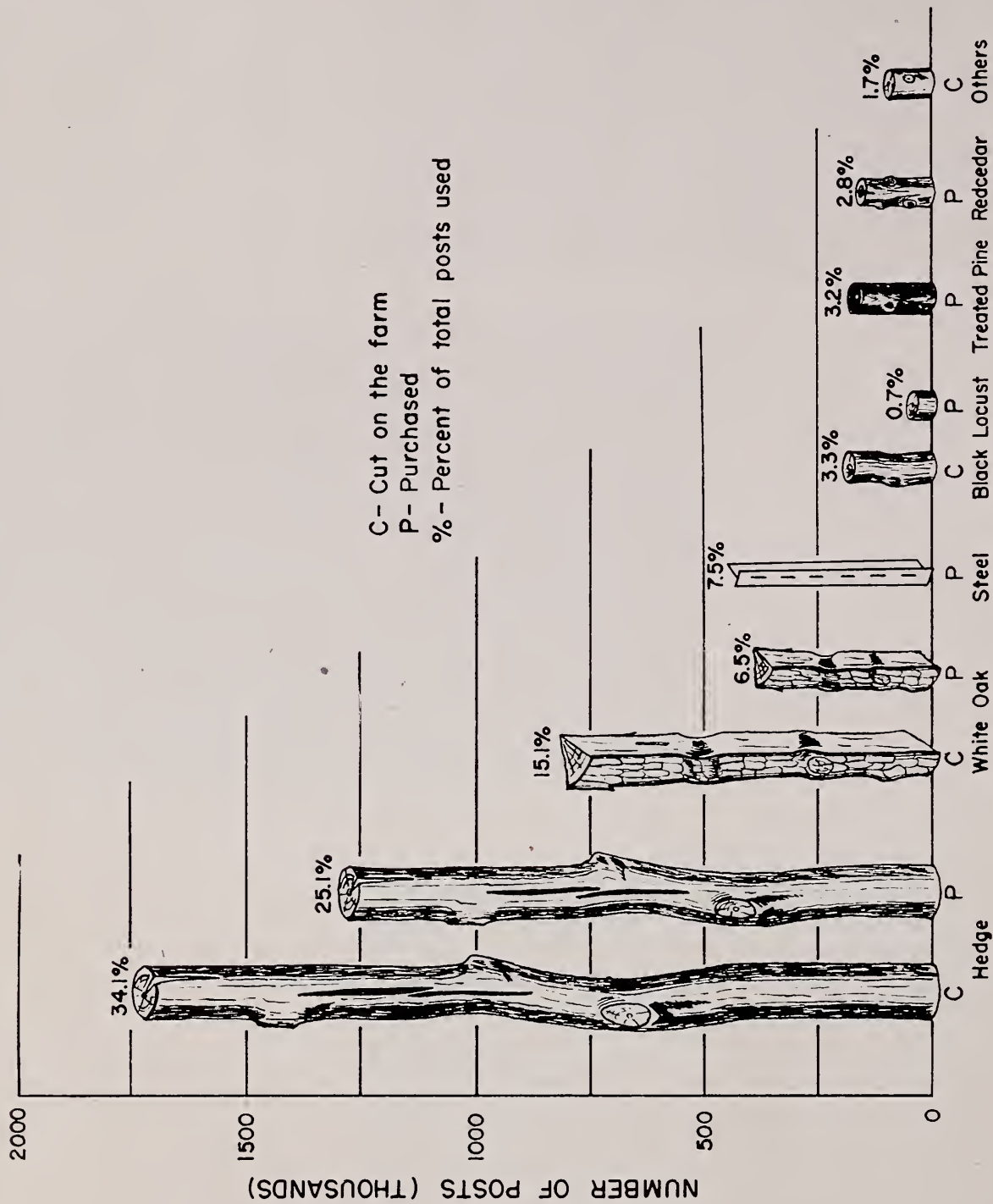
a. This stand must be thinned if satisfactory growth is to be maintained.

b. An improvement thinning of 30-year-old short leaf pine produced 650 fence posts per acre in addition to an operable volume of saw timber.



c. This neat fence constructed with creosote treated pine posts, should be servicable for at least 25 years.

Figure 2. Missouri Ozark pine stands can provide excellent fence post material.



KIND AND SOURCE OF POSTS

Figure 3.—Fence posts used by farmers in northwest Missouri in 1949.

used railroad ties to \$3.50 for large hedge posts. These variations in prices depend largely upon size, quality and availability.

ESTIMATES FOR 1951 INDICATED A SHARP INCREASE IN PURCHASE OF TREATED PINE POSTS

In order to detect any changes or trends in fence post markets that may affect the use of treated pine posts, farmers were questioned regarding their plans for purchasing posts in 1951. The survey results indicated that farmers in the study area expected to buy about three million posts in 1951 (table 2). This is an increase of 28 per cent over 1949 purchases and means that the average farmer purchased about 69 posts in 1951 if total purchases were as large as the estimates.

Farmers planned to buy fewer of all kinds of posts except treated pine and black locust. However, black locust posts are not available in large quantities and, unless the

present planting program is greatly expanded, they are not likely to become a major post in this area.

Steel post purchases in 1951 were expected to be about 10 per cent less than 1949 purchases. Most of this reduction is probably due to the demands for steel by increasing defense production. As early as the fall of 1950, when the full impact of mobilization had not yet been felt, some farmers had difficulty obtaining steel posts. Others had resigned themselves to the anticipated shortage and had made plans to purchase some kind of wooden posts.

The farmers' estimates indicated that they would buy only one-third as many redcedar posts in 1951 as they did in 1949. Their experience with the nondurable sap cedar is an important reason for this change. Farmers also planned to buy less than half as many white oak posts in 1951 as they did in 1949. Apparently, many farmers who bought white oak posts in the past plan to switch to more durable posts.

Farmers were undecided as to what kind of post to use for approximately 17 per cent of the posts that they expected

Table 3.—Farmers' opinions¹ of the desirable and undesirable features of various kinds of posts.

Kind of Post	Desirable features								Undesirable features						
	Durable	Strong	Straight	Easy to staple	Low initial cost	Will not burn	Grown locally	Easy to set	Not durable	Not strong	Crooked	Hard to staple	High initial cost	Will burn	Won't hold staples
Hedge	x	x					x				x	x			x
Steel	x					x		x		x ³			x		
Black Locust	x	x	x				x					x			
Treated Pine	x	x	x	x									x	x ⁴	
Redcedar			x	x					x	x					
White Oak				x	x		x		x						
Others ²					x		x		x						

¹This table includes only information volunteered by farmers and does not necessarily include all of the desirable and undesirable features of each kind of post.

²Includes red oak, black oak, elm, walnut, and Kentucky coffee tree.

³Steel posts are not actually weak, but livestock pressing against a fence sometimes cause the posts to lean.

⁴There is no evidence that pine posts burn more readily than other wooden posts.

Figure 4. Fence posts commonly used in northwest Missouri.



a. Newly installed hedge post that has checked allowing the staples for the lower three strands of wire to pull loose.



b. Hedge posts are often small and crooked but are used because they are long-lasting.



e. White oak posts are estimated to last 10 years in northwest Missouri. Alternate posts have rotted off but were left in place.



g. Properly treated pine posts make a strong, neat and long-lasting fence.



c. Black locust makes an excellent post but is not available in large quantities.



d. Redcedar posts are generally considered good posts, but northwest Missouri farmers don't like "sap cedar".



f. Steel fence posts leaning from livestock pressure.

to buy in 1951. Many of the farmers who were undecided indicated that they would buy the cheapest durable post they could get. If the price of treated pine were low enough to compare favorably with hedge, many farmers said that they would buy treated pine posts.

The most significant fact brought out by the farmers' plans for 1951 post purchases is the shift in favor of treated pine posts. Farmers estimated that they would purchase about four and one-half times as many treated pine posts in 1951 as they did in 1949. Many of these planned post purchases were based on the assumption that treated pine posts would be for sale at the same general price (\$0.50-\$0.75) as other durable posts, and that hedge posts would be more difficult to obtain because more and more hedge rows are being removed and less labor is available for making hedge posts. Another probable reason for the expected increase in treated pine post purchases is that more and more farmers have been using pine posts on a trial basis and have found them satisfactory.

WHAT FARMERS CONSIDER WHEN CHOOSING FENCE POSTS

Most farmers who have suitable post timber like to obtain posts from their own land. More than half of the posts used in 1949 was obtained in this way. Farmers generally consider other factors such as durability, strength, and staple-holding capacity. Most farmers take pride in their fences, and quite frequently they prefer neat posts for roadside fences (fig. 2c). Although opinions varied as to which was the most satisfactory kind of post, farmers usually agreed as to a post's good and bad points. Their opinions of these good and bad qualities are listed in table 3 and discussed below.

Most farmers in northwest Missouri prefer the durable, home-grown hedge posts. Six of every 10 posts used in 1949 were hedge. In addition, rows of hedge trees have long been used as living fences. Most of these hedge rows have been allowed to grow untrimmed and are the source of most of the hedge posts used in the area (Fig. 1). Now, however, many of these hedge rows are being removed to obtain more cropland and to widen roads. Although most farmers consider hedge posts highly desirable, there are some objections to them

Table 4.—A comparison of farmers' estimates of fence post service life with estimates made in other areas.

Kind of post	Expected average service life			
	Northwest Missouri	Lake States ¹	Virginia ²	Illinois ³
	Years			
Hedge	38	—	20-30	very durable
Steel	30	20	—	—
Black locust	27	—	20-30	very durable
Treated pine	26	25	20-30	very durable
Redcedar	14	12	20-30	durable
White Oak	10	12	10-20	durable
Others ⁴	6	3-7	2-4	not durable

¹J. R. Neetzel and S. A. Engene. *What do fence posts cost on an annual basis?* Lake States Forest Experiment Station. Technical Note No. 341. October, 1950.

²R. A. Hertzler and Walton R. Smith. *The preservative treatment of Virginia's fence posts.* Division of planning and Economic Development, Department of Conservation and Development, Richmond, Va.

³C. S. Walters, *Preserve your posts with Penta.* University of Illinois, College of Agriculture. Circular 636, February, 1949.

⁴Includes red oak, black oak, elm, untreated pine, cottonwood, birch, and hickory.

Table 5.—Average annual cost of line fence posts and proportions of line posts used.

Kind of post	Annual cost	Proportion of line posts used
	Dollars	Per cent
Hedge	\$0.02	59.1
Black Locust	.02	3.9
Steel	.03	7.7
Treated pine	.03	3.0
White oak	.04	22.0
Redcedar	.04	2.9
Other ¹	.07	1.4
Total		100.0

¹Includes red oak, black oak, elm, walnut, and Kentucky coffee tree. Because no record of the purchase of these posts was obtained, a purchase price of \$0.20 was assumed.

(figs. 4a and 4b). The chief objections are that hedge is hard to staple and does not sold staples well. Also, hedge posts are crooked, heavy, and difficult to make.

White oak is the second most frequently used post even though it is not very durable (fig. 4e). Since white oak post timber is present on many northwest Missouri farms, farmers use these home-grown posts that require no cash outlay. They consider their labor the only cost of these posts and do not place enough value on their labor. High prices and the demand for more farm products are causing farmers to devote more time to crop production; as a result, they have less time for maintaining fences and other farm improvements. This has resulted in a gradual shift from white oak and other native species to the more durable fence posts which require less labor for maintenance.

Steel posts are durable and very easy to install, but they are costly. The purchase price is high, and they must be set at shorter intervals than wooden posts if the fence is to be strong enough to hold livestock (fig. 4f).

Although black locust is a durable post and has other desirable qualities, it was not used extensively because it was not available in large quantities (fig. 4c).

Throughout most of the country, eastern redcedar is considered a good, durable fence post (fig. 4d), but many farmers in northwest Missouri do not like cedar posts. Many of the redcedar posts that have been trucked in from the nearby Ozarks in recent years have been small, round posts with a large proportion of sapwood. These posts are not durable and, consequently, farmers consider them a poor investment.

Treated pine posts are durable. In addition, they are strong, straight, and make a neat fence (fig. 4g). Because of the high price and farmers' lack of experience with treated pine posts, few are used. Many farmers do not care to experiment with a post of unknown quality at a higher price than they are now paying for durable hedge posts. Since only three per cent of the line posts used in 1949 was treated pine, there is a good opportunity to expand the market for these posts if selling prices are comparable to other long-lasting posts now available.

One of the most important considerations in choosing a post is its average service life. Farmers realize this and

are able to give fairly uniform estimates of post durability. They have estimated that hedge, steel, black locust, and treated pine are the most durable. These estimates agree with service-life estimates made in other areas (table 4).

From the standpoint of annual cost, farmers in northwest Missouri make a fairly good choice of posts from what is available. Using the average-life estimate and the average purchase price obtained from farmer-interviews, and an average setting cost of 20 cents per post³, the annual cost of each kind of line post was calculated and is given in table 5. In order to compare costs per year with choice of posts, the per cent of line posts used by kind is included in this table.

MARKET OUTLOOK FOR TREATED PINE FENCE POSTS IS GOOD

During 1949 farmers in northwest Missouri used an average of 117 fence posts per farm. Fence post replacement and fence rebuilding have been accelerated since World War II. During the war, farmers did very little work on their fences; the labor supply was limited, and farmers were busy increasing crop production. Because fencing is usually an off-season job and only a limited amount of time can be spent at it each year, it will be several years before the war lag has been overcome. Even under normal replacement practices, farm areas near the Missouri Ozarks should provide a good market for fence posts.

The average farmer purchased 32 posts per 100 acres in 1949 and planned to buy 40 posts per 100 acres in 1951. He may be buying more posts for several reasons: the shortage of farm labor, higher wages paid to farm laborers, more fencing, larger crop production goals, depletion of post timber within the area, and an increase in farmers' purchasing power. This situation will probably continue for some time.

The fact that hedge rows are being eliminated is also changing the fence post picture. Clean farming practices and intensive row cropping have accelerated their removal. Hedge posts are becoming more difficult to obtain each year, and, because of present practices, fewer hedge posts will be available in coming years. Farmers maintain that 20 to 30 feet on both sides of a hedge row can't be cropped because the hedge saps the ground. Also, according to some farmers, hedge trees in fence rows on good land are not as profitable as high-yielding annual crops. Hedge rows are also disappearing because roads are being improved in rural areas—in most cases, roadside hedges must be removed when the road is improved or widened.

Farmers will turn to another kind of post in the near future. Because farmers of this area are accustomed to long-lasting hedge posts and short-lived posts mean a costly investment in labor, the demand for posts with a long service

life will probably increase. Black locust, a long-lasting, low-cost post, is not available in large quantities. Redcedar is generally considered a durable post, but the market for redcedar in northwest Missouri is getting smaller because small posts with high proportions of sapwood have led farmers to mistrust all cedar posts. Steel posts are easy to install, have a long life, and are neat; however, they are high priced and are in short supply.

Use of multiflora rose as a living fence has not been great enough to have a noticeable effect on post markets. However, more multiflora rose is being used each year and its use may eventually affect the post market.

Pine posts, properly treated, appear to be a logical replacement for the rapidly disappearing hedge. Pine posts are strong, easy to handle, have a long service life, and make a neat fence. A few farmers have used treated pine posts for a number of years and are sold on their merits. Others who have become familiar with pine posts want to try them. However, most of the farmers are reluctant to substitute the untried treated pine for the proven hedge post. To stimulate sales it may be necessary to provide prospective buyers with reliable information regarding the qualities of treated pine posts. Post dealers in the area believe that if these qualities become better known and if prices are right, large quantities of pine posts can be marketed.

INCREASED USE OF PINE POSTS WILL BENEFIT FOREST OWNERS AND LOCAL INDUSTRIES

Many pine stands in the Missouri Ozarks now contain enough timber of suitable size to supply post material in commercial quantities. Most of the stands now need, or will need, thinning if optimum growth is to be attained. Since these pine stands are within 200 miles of post-importing farm regions, operators making posts in south Missouri should be able to compete with more distant suppliers in southern states who now export posts for use in the cornbelt.

The national forests in Missouri are making limited post sales on a trial basis. Also, a few timber operators in the Missouri Ozarks cut pine posts from private land and sell them to large timber companies for preservative treatment. If small hot-and-cold-bath creosote treating plants similar to those now operating in the South were set up, pine post cutting operations in the Missouri Ozarks could be increased.

When the pine post market becomes better established in the Missouri Ozarks, forest owners and managers should be able to make thinnings at a profit and at the same time improve the growing conditions of their stands. A post market should also provide additional opportunities for local employment and for establishing small rural industries.

³J. R. Neetzel, *Cost of Setting Fence Posts in Minnesota*, Lake States Forest Experiment Station. Technical Note No. 350. January 1951.

